National Aeronautics and Space Administration

NASA

MSFC
Space Systems Department

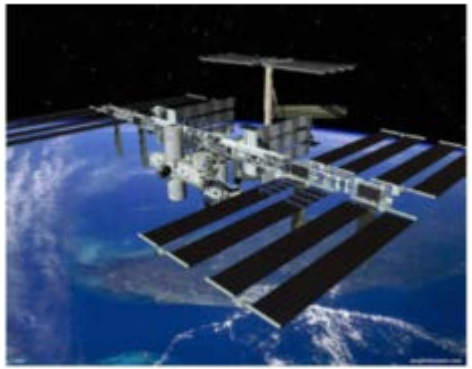
December 9th, 2019

EXPLORE MARSHALL

- MSFC Space Systems Department is proud to support the 12th annual Flight Software Workshop.
- This workshop provides an opportunity to present current flight architectures, novel approaches to mission solutions, and techniques for flight software development, integration, test and verification.
- MSFC Space Systems Department provides cross-cutting engineering capabilities required to meet the challenges of current and future Space Flight Systems.

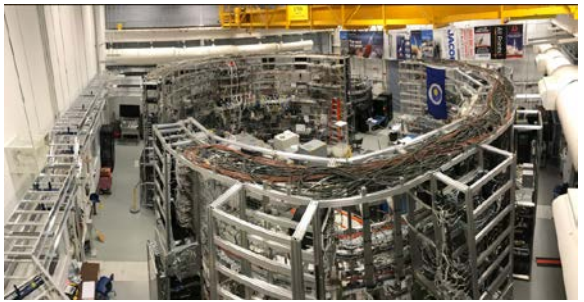
Space Systems Department Capabilities

- Space Launch Systems (SLS) Flight Computer Software,
- Environmental Control and Life Support System (ECLSS) Software for International Space Station,
- Flight Software supporting Heliophysics experiments,
- Mars Ascent Vehicle Flight Software
- core Flight System (cFS)
- Agile Development Process, SME for NPR 7150.2
- Autonomous Systems and Machine Learning
- Automated Tools for Test & Verification
- CMMI level 3, Human-rated Class A software
- Modeling and Simulations, Hardware-in-the-loop testing



- Space Systems Department Capabilities will be discussed in greater depth through the following presentations at the workshop:
  - core Flight System for MAV (Stefanie Justice)
  - Hands-on tutorial of cFS on Raspberry pi
  - Real-Time Hardware-in-the-Loop Simulation and Test Conductor Platforms (Ashley Lee)
  - Transitioning Space Launch System Flight Software Test Approach from Manual Data Analysis to Automated (Shaun Phillips)
  - SLS Flight Software: Ensuring Highly Reliable Software during Development (Deanna Whitehead)

- MSFC Tour
  - Systems Integration Lab (SIL)
  - Environmental Control Life Support Systems
  - Thrust Vector Control
  - ISS Payload Operations Integration Center



Presentations and Tour

- MSFC Space Systems Department is evolving to prepare for future needs.
- Innovation in technology, process (agile for software and hardware)
- Partnership with private industry requires:
  - Development of new operating models,
  - Alternative standards, and
  - Nimble workforce

Summary